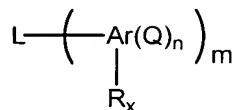


## WHAT IS CLAIMED IS:

1. A compound having the structure:

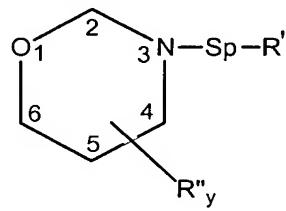


wherein:

$\text{L}$  is an optional alkylene or siloxane linking moiety,

$\text{Ar}$  is optionally substituted arylene,

$\text{Q}$  is an oxazine ring or amine salt thereof having the structure:



and is bonded to  $\text{Ar}$  in a fused manner at positions 5 and 6 of the oxazine ring,

wherein:

$\text{Sp}$  is optional, and if present, is a  $\text{C}_1$  to  $\text{C}_6$  alkylene oxyalkylene,

thioalkylene, carboxyalkylene, amidoalkylene, or sulfonatoalkylene

spacer,

$n$  is 1 or 2,

$m$  is optional, and if present, is 1 or 2,

$x$  and  $y$  are each independently 0 to 4, and

wherein at least one of  $\text{R}$ ,  $\text{R}'$ , or  $\text{R}''$  is a polymerizable moiety.

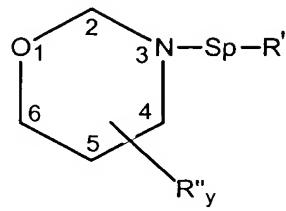
2. A compound according to claim 1 having the structure:



wherein:

$\text{Ar}$  is optionally substituted arylene,

$\text{Q}$  is an oxazine ring or amine salt thereof having the structure:



and is bonded to Ar in a fused manner at positions 5 and 6 of the oxazine ring,

Sp is optional, and if present, is a C<sub>1</sub> to C<sub>6</sub> alkylene, oxyalkylene, thioalkylene, carboxyalkylene, amidoalkylene, or sulfonatoalkylene spacer,

n is 1 or 2,

x and y are each independently 0 to 4, and

wherein at least one of R, R', or R'' is a polymerizable moiety.

3. A compound according to claim 1, wherein said polymerizable moiety participates in an addition polymerization.

4. A compound according to claim 3, wherein said addition polymerization is a free-radical polymerization, anionic polymerization, cationic polymerization, or ring-opening polymerization.

5. A compound according to claim 4, wherein said polymerizable moiety is optionally substituted alkenyl, oxyalkenyl, alkynyl, cycloalkenyl, bicycloalkenyl, styryl, (meth)acrylate, itaconate, maleimide, vinyl ester, epoxy, cyanate ester, nitrile, diallyl amide, benzocyclobutene, aromatic propargyl ether, aromatic acetylene, or oxazoline.

6. A compound according to claim 5, wherein said polymerizable moiety is alkenyl, oxyalkenyl, (meth)acrylate, maleimide, or cycloalkenyl.

7. A compound according to claim 1, wherein said polymerizable moiety participates in a condensation polymerization.

8. A compound according to claim 7, wherein said polymerizable moiety is a siloxane.

9. A compound according to claim 2, wherein said polymerizable moiety participates in an addition polymerization.

10. A compound according to claim 9, wherein said addition polymerization is a free-radical polymerization, anionic polymerization, cationic polymerization, or ring-opening polymerization.

11. A compound according to claim 10, wherein said polymerizable moiety is optionally substituted alkenyl, oxyalkenyl, alkynyl, cycloalkenyl, bicycloalkenyl, styryl, (meth)acrylate, itaconate, maleimide, vinyl ester, epoxy, cyanate ester, nitrile, diallyl amide, benzocyclobutene, aromatic propargyl ether, aromatic acetylene, or oxazoline.

12. A compound according to claim 11, wherein said polymerizable moiety is alkenyl, oxyalkenyl, (meth)acrylate, maleimide, or cycloalkenyl.

13. A compound according to claim 2, wherein said polymerizable moiety participates in a condensation polymerization.

14. A compound according to claim 13, wherein said polymerizable moiety is a siloxane.

15. A compound according to claim 2, wherein optionally substituted Ar is phenylene or naphthylene.

16. A compound according to claim 15, wherein optionally substituted Ar is phenylene.

17. A compound according to claim 15, wherein Ar is naphthylene.

18. A compound according to claim 1, wherein L is alkylene.

19. A compound according to claim 1, wherein L is siloxane.

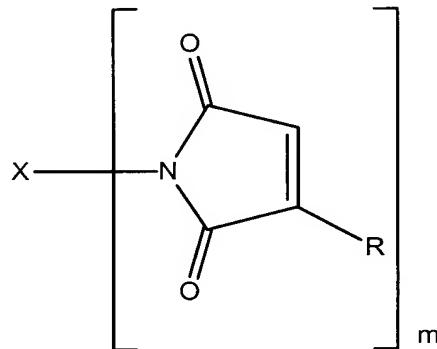
20. An adhesive composition comprising a compound according to claim 1 and a curing catalyst.

21. An adhesive composition according to claim 20, further comprising one or more co-reactants.

22. An adhesive composition according to claim 21, wherein said co-reactants are maleimide, epoxy, urethane, or cyanate ester.

23. An adhesive composition according to claim 22, wherein said maleimide is a liquid maleimide.

24. An adhesive composition according to claim 23, wherein said liquid maleimide has the structure:



wherein:

m is 1-3,

each R is independently hydrogen or lower alkyl, and

X is a saturated straight chain alkyl, alkylene, or alkylene oxide, or branched chain alkyl, alkylene or alkylene oxide, optionally containing

saturated cyclic moieties as substituents on said alkyl, alkylene or alkylene oxide chain or as part of the backbone of the alkyl, alkylene or alkylene oxide chain.

25. A thermosetting resin composition comprising:

- A) a compound according to claim 1,
- B) a liquid maleimide,
- C) a coupling agent, and
- D) a cure initiator.

26. A die-attach paste comprising:

in the range of about 10 up to 80 wt% of a thermosetting resin composition according to claim 25, and

in the range of about 20 up to about 90 wt% of a filler.

27. A die-attach paste according to claim 26, wherein the filler is conductive.

28. A die-attach paste according to claim 27, wherein said filler is electrically conductive.

29. A die-attach paste according to claim 27, wherein said filler is thermally conductive.

30. A method for enhancing adhesive strength of a thermosetting resin composition, said method comprising incorporating an effective amount of a compound according to claim 1 into said composition.

31. A method for enhancing adhesion of a substrate bound to a metallic surface by a thermosetting resin composition, said method comprising incorporating a compound according to claim 1 into said thermosetting resin composition.



32. A method according to claim 31, wherein said metallic surface is copper.

33. A method for adhesively attaching a substrate to a metallic surface, said method comprising curing a die-attach paste positioned between said substrate and said metallic surface, wherein said die-attach paste comprises a compound according to claim 1.

34. A method according to claim 33, wherein said substrate is a semiconductor die and said metallic surface is a lead frame.

35. A method according to claim 34, wherein said lead frame is a copper lead frame.

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